Fimbristylis buchanensis R.Booth & P.R.Sharpe and *F. triloba* R.Booth & P.R.Sharpe (Cyperaceae), two new species from Queensland

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Summary

Booth, R. & Sharpe P.R. (2017). *Fimbristylis buchanensis* R.Booth & P.R.Sharpe and *F. triloba* R.Booth & P.R.Sharpe (Cyperaceae), two new species from Queensland. ***Austrobaileya* 10(1): 47–58.** Two new species of Fimbristylis Vahl, are described, *viz*. *Fimbristylis buchananensis* R.Booth & P.R.Sharpe, *F. triloba* R.Booth & P.R.Sharpe. The new taxa are illustrated and notes are provided on their distribution and habitat. An identification key to Queensland species of *Fimbristylis* is provided.

Key Words: Cyperaceae, *Fimbristylis*, *Fimbristylis buchananensis*, *Fimbristylis triloba*, Australia flora, Northern Territory flora, Queensland flora, taxonomy, identification key

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Introduction

The genus *Fimbristylis* Vahl has *c*. 300 species distributed in tropical and subtropical regions, with some extending into warmer parts of temperate regions. The species mainly occur in SE Asia, Malesia and northeastern Australia (Goetghebeur 1998). Unlike *Cyperus* L., few species are pantropical, with the number of endemic species being relatively high (Kern 1974). S.T. Blake, who contributed much to our understanding of the Queensland species, suggested that the genus was represented by *c*. eighty species in Australia (Blake 1940), with Latz (1990) including 128 species in his draft key to Australian species of *Fimbristylis*.

Vahl (1805) segregated *Fimbristylis* from *Scirpus* Vahl, including in the former only those species with spirally arranged glumes and a biconvex or trigonous nut, and a basally expanded, usually ciliate, 2 or 3 branched style. He placed those with sub-distichous basal glumes and a trigonous style base that is persistent on the fruit in the genus *Abildgaardia* Vahl. The genus *Bulbostylis* Kunth was erected by Kunth (1837) for species considered intermediate between *Isolepis* R.Br. and *Fimbristylis*. Subsequent authors have variously recognized *Fimbristylis*, *Bulbostylis* and *Abildgaardia* as three separate genera, or treated them as either two genera, or even one genus on the basis of morphological similarities (Bruhl 1995; Muasya *et al*. 2009). Ghamkhar *et al*. (2007) in a molecular analysis argued for the retention of *Abildgaardia* (except *A. vaginata* R.Br.) distinct from *Bulbostylis* and *Fimbristylis*. For convenience, in the key provided we have included the genus *Abildgaardia* alongside *Fimbristylis*.

Sharpe (1986) provided manuscript names and preliminary descriptions for the two species here formally described and named and included them in a DELTA key (Jessup *et al*. 2005 onwards). Due to the extensive field work undertaken in recent years by staff of the Queensland Herbarium, particularly in north Queensland, more *Fimbristylis* material has become available for study. Critical examination of these collections by the first author has now enabled these new species to be formally described and named.

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Materials and methods

All herbarium specimens of *Fimbristylis* held at BRI have been examined. Measurements were made from dried material. A common abbreviation used in the text and specimen citation is NP (National Park).

Taxonomy

Fimbristylis buchananensis R.Booth & P.R.Sharpe **sp. nov.** Similar to *Fimbristylis cymosa* R.Br. but differs in the longer (> 2.8 mm) glumes versus < 2.25 mm long glumes; the longer (5–13 mm long) oblong spikelets versus shorter (3–6 mm long) ovate spikelets and the narrower (0.3–0.6 mm wide) lamina versus 1 to 3 mm wide. **Typus:** Queensland. Mitchell District: The Lake, east of Aramac, 11 March 1998, *R.J. Fensham 3479* (holo: BRI, iso: NSW).

Fimbristylis sp. Lake Buchanan (V.J.Neldner +3362); Booth (2014).

Slender perennial with a short rhizome, 25–65 cm tall. Culms tufted, erect, trigonous, smooth, or striate, 0.8–1.5 mm wide. Sheaths yellowish-brown to dark brown. Leaves all basal, less than half length of inflorescence culm. Lamina erect, flat or canaliculate, straight, 0.3–0.6 mm wide, ciliate or scabrid on the margins. Ligule membranous. Involucral bracts 1–4; longer or shorter than the inflorescence, erect, or oblique. Inflorescence simple or once compound, panicle-like, 2–6-branched, 3–6 cm long. Spikes 1–10, sessile, or pedunculated, ovoid, spreading, or erect, dense, 5–13 mm long, 1.5–15 mm wide. Spikelets erect, ovoid, oblong, oblong-ovoid or cylindrical, open or dense, acute, 5–13 mm long, 1.5–2.5 mm wide, 10–26-flowered, pedicellate or sessile, straight, 1–14 per cluster, stramineous or pale brown to brown. Stamens 3; anthers linear, 1.2–1.5 mm long, connective setulose. Rachis angular but not broadly winged. Glumes spirally arranged, membranous, ovate, narrowly ovate or ovate-lanceolate, 2.8–3.4 mm long, 1.2–1.5 mm wide, apex acuminate, with a straight mucro, surface glabrous, keeled with an arcuate keel, 2-nerved, sides nerveless, margin glabrous. Rachilla persistent on rachis after glumes and achenes have fallen off, winged. Style deciduous, longer than stigmas, longer than achene, fimbriate, flat, dilated at the base. Stigmas three. Achene obovoid, trigonous, margins obtuse, 0.9–1.1 mm long, 0.5–0.7 mm wide, with 3 longitudinal ribs, surface with fine, longitudinally linear cells in many vertical rows, tuberculate with age, apex apiculate or truncate, base stipitate. **Fig. 1.**

***Additional specimens examined*: Queensland.** Burke District: Near the source of Poison Creek, *c.* 90 miles [150 km] N of Hughenden, Apr 1935, *Blake 8561* (BRI). South Kennedy District: W of Lake Constant, 2 km W of Lake Buchanan, May 1991, *Neldner & Thompson 3362* (BRI); Lake Constant foreshore, 1.8 km W of Lake Buchanan, May 1991, *Neldner & Thompson 3356* (BRI); W edge of Lake Buchanan, Yarrowmere Station, Mar 1998, *Kemp 3380H* (BRI); 21 km S of Yarrowmere Homestead, on eastern side of lake, Mar 2002, *Thompson BUC2197* (BRI); Lake Buchanan, Mar 1998, *Thompson BUC2128* (BRI).

***Distribution and habitat*:** *Fimbristylis buchananensis* is endemic to Queensland and has been found from *c.* 90 km north of Hughenden to as far south as Aramac, with most collections around Lake Buchanan and Lake Constant (**Map 1**). Most collections have been around lake foreshores, on old sand dunes or remnant lake beds.

***Affinities*:** *Fimbristylis buchananensis* has some similarities to more robust forms of *F. cymosa* which it differs from most obviously in the glume length, in the longer, oblong spikelets and the narrower lamina. The plants also grow in different habitats, *F. cymosa* being mostly coastal with saline influence, while *F. buchananensis* occurs in inland areas, mainly in old dune systems.

***Conservation status*: Least Concern**.

***Etymology*:** Named after Lake Buchanan south west of Charters Towers where the species is commonly found.

Fimbristylis triloba R.Booth & P.R.Sharpe **sp. nov.** Similar to *Fimbrisytlis rara* R.Br. but differs in the larger achene (1.2–1.4 mm long versus 0.8–1.1 mm); longer glumes (> 3.5 mm, versus < 2.5 mm) with an acute apex (versus obtuse) and glandular markings (versus absent). **Typus:** Queensland. Burke District: Esmeralda, SSE of Croydon. 19 July

Fig. 1. ***Fimbristylis buchananensis.*** A. base of plant ×0.6. B. inflorescence ×0.8. C. spikelet ×8. D. spikelet with rhachilla ×8. E. achene with filaments, style and stigmas ×16. F. achene with style and stigmas ×32. A & B from *Kemp 338OH* (BRI); C–F from *Neldner & Thompson 3362* (BRI). Del. W. Smith.

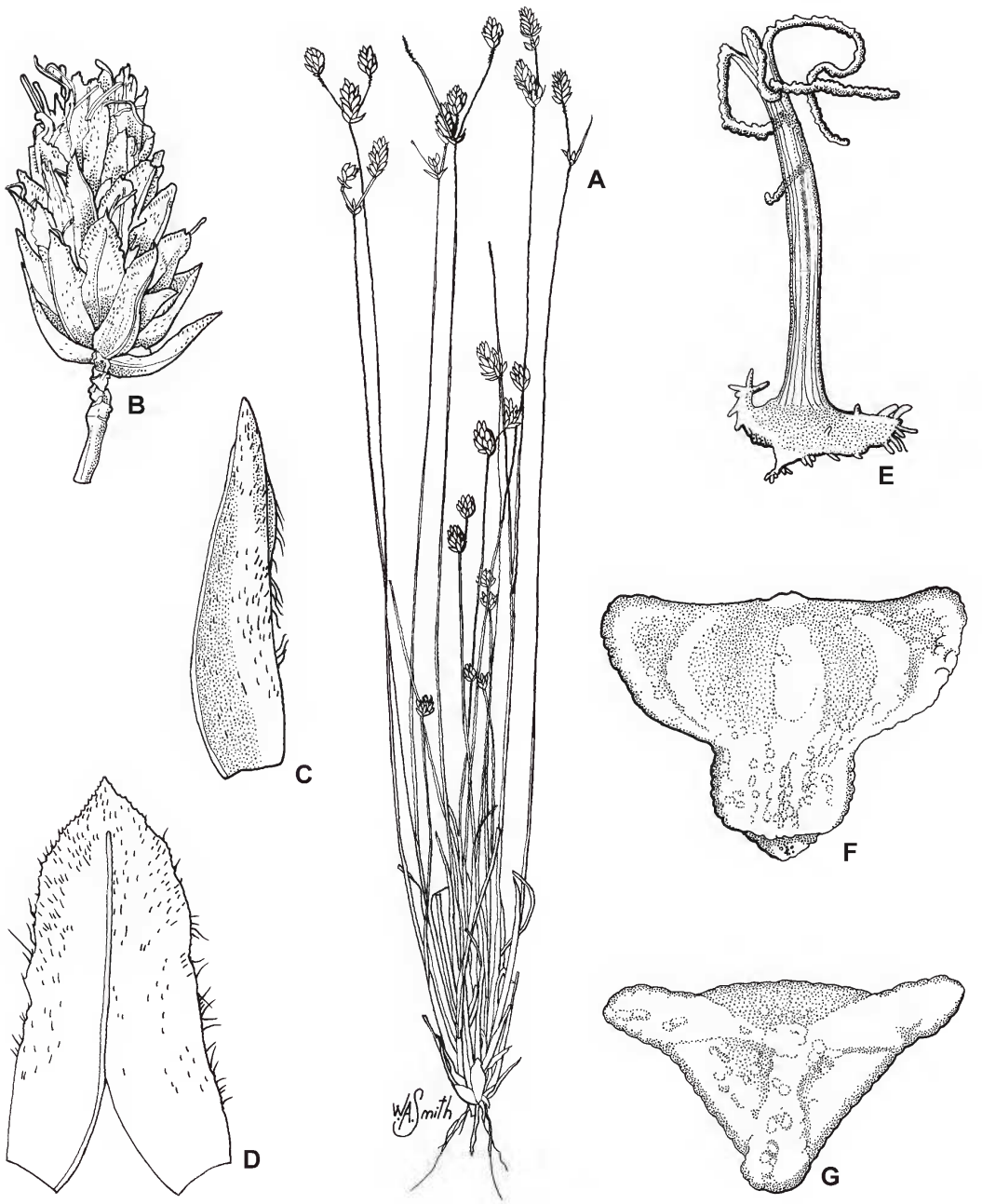

Fig. 2. ***Fimbristylis triloba.*** A. whole plant ×0.5. B. spikelet ×4. C. glume (side view) ×12. D. glume (dorsal view) showing brown flecks on the surface ×12. E. stigmas and style ×32. F. achene (lateral view) ×32. G. achene from above ×32. All from *Blake 19640* (BRI). Del. W. Smith.

1954, *S.T. Blake 19640* (holo: BRI; iso: NSW, NT, PERTH).

Fimbristylis sp. (Esmeralda Gorge S.T. Blake 19640); Booth (2014).

Slender annual with fibrous roots, 12–50 cm tall. Culms tufted, trigonous, striate, scabrous, 0.5–1.2 mm wide. Leaves all basal, shorter than the stem. Lamina flat, straight, 1–1.5 mm wide, glabrous, margins in lower part hyaline, spotted with brown flecks. Involucral bracts 2–4, glume like, shorter than the spikelet, smooth. Inflorescence simple or once compound, open, consisting of 1–5 primary rays obliquely erect. Spikelets solitary, ovoid or almost globular, obtuse, many-flowered, erect, 5–12 mm long, 3–6 mm wide, pale brown to brown. Stamens 3; anthers linear, connective smooth, 1.8–2 mm long. Glumes spirally arranged, ovate, or broadly ovate, 3.5–5 mm long, light brown to brown with red-brown glandular markings, surface glabrous, apex acute, margin ciliate, keeled without nerves; rachilla persistent on rachis after glumes and achenes have fallen off, narrowly winged. Style as long as stigmas, triquetrous, glabrous, base prominently enlarged, triangular, surface with short, turgid hairs. Stigmas three. Achene broadly obovoid or obpyriform, trigonous, apex truncate, base rather prominently stipitate, lobes at the distal end decurrent on achene angles; 1.2–1.4 mm long, 0.8–1 mm wide, smooth, epidermal cells isodiametric. **Fig. 2.**

***Additional specimens examined*:** Queensland. Cook District: Adjacent to Pelican Creek, Staaten River NP, Apr 2004, *Fox 3113* (BRI); S of Highbury Homestead, Staaten River NP. Apr 2004, *Fox 3112* (BRI); 153 km NE of Normanton, Jul 2001, *Thompson NOR181* (BRI).

***Distribution and habitat*:** *Fimbristylis triloba* is endemic to Queensland and has been collected as far north as Staaten River NP and as far south as Esmeralda Station (**Map 1**). It has been recorded from seepage areas, mainly in *Melaleuca* dominated woodlands on sand.

***Affinities*:** *Fimbristylis triloba* is similar to *F. rara*, but easily distinguishable by the length of the glumes that are reddish-brown spotted and the glume apex shape. The inflorescence of *F. triloba* resembles that of *F. helicophylla* Rye, R.L.Barrett & M.D.Barrett which is restricted to the Kimberley in Western Australia. It differs in the distinctive obpyriform achene of *F. triloba*, compared to ovate in *F. helicophylla*; also the leaves of *F. helicophylla* are broad, fleshy, twisted and up to 3.6 mm wide, versus straight and up to 1.5 mm wide in *F. triloba.*

Conservation status: Least Concern. Present in Staaten River NP.

***Etymology*:** Named for the three lobes at the distal end of the angles of the achenes.

Key to Queensland species of *Fimbristylis* and *Abildgaardia*

1 Spikelets solitary on each stem **2**
1. Spikelets more than one on each stem **35**

2 Stigmas 2 . . . . . **3**
2. Stigmas 3 . . . . . **14**

3 Achene with transverse, wavy ridges **4**
3. Achene longitudinally striate, finely reticulate, smooth or tuberculate **8**

4 Spikelet oblique or distinctly nodding; style broad, *c.* 0.5 mm wide . . . . . **F. nutans**
4. Spikelet erect; style narrow, < 0.4 mm wide 5

5 Glumes 1.5–1.8 mm long . . . . . **F. nuda**
5. Glumes > 2 mm long **6**

6 Upper part of top most glumes with short fine hairs on the surface or margin . . . . . **F. punctata**
6. Upper part of glumes glabrous 7

7 Lowest glume broadly obtuse, much shorter than fertile glumes; mature achene broadly obovate to sub-orbicular, usually > 1.4 mm long, often dark brown with a white annulus at the base . . . . . **F. acuminata**
7. Lowest glume obtuse or acute, only slightly shorter than the fertile glume; mature achene obovate, < 1.4 mm long, usually white or straw coloured without a white annulus at the base . . . . . **F. acicularis**

8 Spikelet 1–3 mm wide **9**
8. Spikelet > 3 mm wide **12**

9 Spikelet cylindrical 6–15 mm long; leaves mostly reduced to sheathing scales; achene < 0.5 mm long, finely tuberculate; upper flowers female only . . . . . **F. denudata**
9. Spikelet fusiform or ovoid-elliptical; leaves developed; achene > 0.5 mm long, not tuberculate **10**

10 Achene nearly terete, obovoid-globose, obscurely 2-angled, dark brown; glumes 1–1.5 mm long . . . . . **F. distincta**
10. Achene biconvex, acutely angled, grey or white; glumes 2–3 mm long **11**

11 Spikelets 2–3 mm wide; glumes muticous; achene 0.8–1.2 mm long, grey . . . . . **F. polytrichoides**
11. Spikelets < 1.6 mm wide; glumes with > 0.3 mm long mucro; achene 0.6–0.7 mm long, white to pale brown . . . . . **F. adjuncta**

12 Achene oblong-cylindrical, ribbed longitudinally with a conspicuous gynophore 0.5–1 mm long; upper parts of the stem quadrangular . . . . . **F. tetragona**
12. Achene biconvex, obovoid with gynophore < 0.5 mm long; upper part of the stem terete or flattened **13**

13 Glumes 4–6 mm long; base of stem bulbous . . . . . **F. tristachya**
13. Glumes 2.5–3 mm long; base of stem not bulbous . . . . . **F. schoenoides**

14 Spikelet oblique or at right angles to stem **15**
14. Spikelet erect **16**

15 Glume apex with two terminal wings with red, linear flecks; glabrous . . . . **F. costiglumis**
15. Glume apex rounded; finely ciliate . . . . . **F. densa**

16 Fertile glumes > 8.5 mm long **17**
16. Fertile glumes < 8 mm long **18**

17 Plants with well-developed leaves; glumes 8.5–10.2 mm, distinctly awned; achene 2–2.6 mm long, including an abruptly constricted *c.* 1 mm long stipe . . . . . **F. odontocarpa**
17. Plants nearly leafless; glumes 10–15 mm long, acute; achene > 2.6 mm long, stipe acuminate and not constricted . . . . . **F. squarrulosa**

18 Achene long cylindrical with a conspicuous gynophore; upper part of the stem quadrangular . . . . . **F. tetragona**
18. Achene obovate, pyriform or winged, no conspicuous gynophore; upper part of the stem terete or flattened **19**

19 Achene with transversely wavy ridges **20**
19. Achene longitudinally striate, finely reticulate, smooth or tuberculate **21**

20 Spikelets 6–8 mm wide; glumes glabrous . . . . . **F. carolinii**
20. Spikelets 2–4 mm wide; glumes with minute hairs on the upper surface . . . . **F. punctata**

21 Leaves densely minutely hairy . . . . . **F. leucocolea**
21. Leaves glabrous **22**

22 Achene flattened with acute edges, these with distinct wings *c.* 0.5 mm wide **23**
22. Achene not flattened, may be somewhat compressed, with no wings **24**

23 Basal glume less than ½ as long as fertile glumes, glumes 5–7 mm long, distichous; wings on the achene solid . . . . . **F. pachyptera**
23. Basal glumes all of a similar size, glumes 4–6 mm long, spirally arranged; wings on the achene ciliate or membranous . . . . . **F. pterigosperma**

24 Spikelet < 1.5 mm wide; glumes usually < 10 per spikelet . . . . . **F. pauciflora**
24. Spikelet > 1.5 mm wide, glumes usually > 10 per spikelet **25**

25 Glumes entirely glabrous **26**
25. Glumes ciliate on the margins or with hairs on at least parts of the surface **32**

26 Keel at the base of the glume at least 0.4 mm wide, broadly rounded **27**
26. Keel of glume < 0.3 mm wide, angular, if rounded then narrowly so **28**

27 Achene coarsely tuberculate, pale straw to grey brown; style with broad, membranous margins for the entire length; glumes white to straw coloured; clay soils . . . . . **Abildgaardia ovata**
27. Achene smooth or slightly tuberculate, greyish to dark grey/black; style fimbriate, with no membranous margins; glumes, light brown to brown; in rocky situations often with a sandstone influence . . . . . **F. macrantha**

28 Glumes at least 5 mm long; distichous, at least in young spikelets, the rachillas sometimes becoming twisted with age; spikelets strongly laterally compressed, similar to those in *Cyperus* **29**
28. Glumes up to 5 mm long, spirally arranged, not strongly laterally compressed **30**

29 Achene densely tuberculate, 2–2.8 mm long . . . . . **F. oxystachya**
29. Achene reticulated often with a few small tubercules, 1.4–1.8 mm long . . . . . **Abildgaardia vaginata**

30 Spikelet < 2.4 mm wide; glumes < 2.5 mm long . . . . . **F. modesta**
30. Spikelet at least 2.5 mm wide; glumes > 2.5 mm long **31**

31 Glumes oblong acute, lowest (empty) glume more than half as long as the spikelet . . . . . **F. dictyocolea**
31. Glumes broadly obtuse to rounded, lowest glume half or less than half of the length of the spikelet . . . . . **F. simplex**

32 Glumes < 3 mm long **33**
32. Glumes > 4 mm long **34**

33 Achene obpyriform, constricted just below the middle; apex of the spikelets acute . . . . . **F. trigastrocarya**
33. Achene broadly obovoid to obovoid; apex of spikelets obtuse . . . . . **F. sphaerocephala**

34 Spikelets 5–10 mm wide; glumes 5–10 mm long . . . . . **F. recta**
34. Spikelets 2.5–4 mm wide; glumes < 5 mm long . . . . . **F. cardiocarpa**

35 Spikelets more than 1 on each stem but not clustered **36**
35. Spikelets capitate or somewhat clustered **85**

36 Stigmas 2 . . . . . **37**
36. Stigmas 3 . . . . . **58**

37 Achene < 1 mm long **38**
37. Achene > 1 mm long **48**

38 Spikelets, 1–4 (–6), cylindrical, only female flowers in upper part; leaves mostly reduced to sheathing scales . . . . . **F. denudata**
38. Spikelets numerous, ovoid-oblong, all flowers bisexual; leaves with lamina **39**

39 Achene < 0.5 mm long . . . . . **F. caespitosa**
39. Achene > 0.5 mm long **40**

40 Achene sub-cylindrical, oblong-linear in outline . . . . . **F. dipsacea**
40. Achene not as above **41**

41 Style base with numerous long hairs pendent over apex of the achene . . . . . **F. velata**
41. Style base without hairs pendent over achene **42**

42 Achene with 5–10 conspicuous longitudinal ribs on each face with numerous cross-bars, glistening white to stramineous, rarely brown **43**
42. Achene reticulate, smooth or tuberculate, not ribbed as above **45**

43 Upper part of the stem and the base of the involucral bracts with pilose hairs; style shorter than the achene . . . . . **F. depauperata**
43. Upper part of the stem and the base of the involucral bracts either glabrous or with only short hairs on the margins; style longer than the achene **44**

44 Stamens 2 or 3; glumes orbicular . . . . . **F. dichotoma (inland form)**[1]
44. Stamens 1; glumes elliptic . . . . . **F. bisumbellata**

45 Leaves and involucral bracts densely hairy; glumes acute, mucronulate . . . . **F. aestivalis**
45. Leaves and involucral bracts glabrous; glumes obtuse, muticous **46**

46 Glumes < 1.4 mm long . . . . . **F. stenostachya**
46. Glumes > 1.4 mm long **47**

47 Surface of the glumes pubescent . . . . . **F. pubisquama**
47. Surface of the glumes glabrous . . . . . **F. cymosa**

48 Glumes ciliolate on margins or with hairs on part of the surface **49**
48. Glumes entirely glabrous **51**

49 Glumes up to 2.5 mm long, pubescent over most of the surface . . . . . **F. pubisquama**
49. Glumes 2.8–4.5 mm long, pubescent mainly on the upper parts **50**

50 Glumes nearly as broad as long, style *c.* 0.4 mm wide; involucral bracts usually longer than the inflorescence; annual with long leaves . . . . . **F. sieberiana**
50. Glumes considerably longer than broad, style *c.* 0.25 mm wide; involucral bracts shorter than the inflorescence; perennial with short leaves . . . . . **F. ferruginea**

[1] *Fimbristylis dichotoma* is a variable species with many forms. Two of these forms are separated in the above key: *Fimbristylis* sp. (Elizabeth Springs R.J.Fensham 3743) which occurs in artesian springs, and *F. dichotoma* (inland form), a depauperate form that occurs in drier inland areas of Queensland. More study of this extremely variable species is required to determine whether these and other forms can be distinguished consistently.

51 Achene with 5–10 conspicuous longitudinal ribs on each face with numerous cross-bars, glistening, white to stramineous, rarely brown **52**
51. Achene smooth, finely reticulate or verrucose **54**

52 Upper part of the stem and the base of the involucral bracts with pilose hairs; style shorter than the achene . . . . . **F. depauperata**
52. Upper part of the stem and the base of the involucral bracts either glabrous or with only short hairs on the margins; style longer than the achene **53**

53 Spikelets uniform pale brown; glumes with the mid rib finishing in a broad mucro at least 0.2 mm long . . . . **F. sp. (Elizabeth Springs R.J.Fensham 3743)**[1]
53. Spikelets usually with darker brown patches; glume with a mucro < 0.2 mm long . . . . . **F. dichotoma**[1]

54 Inflorescence mainly consisting of a single spikelet, occasionally some with 2 or 3 . . . **55**
54. Inflorescence a panicle consisting of at least 4 spikelets **57**

55 Glumes 4–6 mm long; spikelets 4–5 mm wide; base of stem bulbous . . . . . **F. tristachya**
55. Glumes 2–3 mm long; spikelets 2–4 (–4.5) mm wide; base of stem not bulbous **56**

56 Spikelets 2–3 mm wide; glumes longer than they are broad . . . . . **F. polytrichoides**
56. Spikelets 3–4.5 mm wide; glumes as broad as they are long . . . . . **F. schoenoides**

57 Stem and leaves spongy, compressible . . . . . **F. dolera**
57. Plant with leaves reduced to short sheaths, stems not spongy . . . . . **F. blakei**

58 Glumes with long scabrid awns 1–1.5 mm long . . . . . **F. signata**
58. Glumes without long scabrid awns **59**

59 Style base with hairs pendent over a dark achene . . . . . **F. furva**
59. Style base not with the above combination **60**

60 Glumes folded obtusely around the nut, rounded, causing the glumes to be somewhat flattened at maturity, and spikelets more or less rounded in cross section **61**
60. Glumes folded acutely, not flattened, causing the spikelets to be angular or compressed in cross section **67**

61 Stems sharply 4 or 5 angled; glumes up to 1.5 mm long . . . . . **F. littoralis**
61. Stems 3-angled or terete; glumes > 1.5 mm long **62**

62 Glumes 3.5–5 mm long **63**
62. Glumes < 3 mm long **65**

63 Spikelets oblong, > 3.5 times longer than broad **64**
63. Spikelets broadly ovoid to almost globular < 2.5 times longer than broad . . . . . **F. triloba**

64 Glumes with distinct reddish-brown linear flecks on the surface . . . . . **F. lanceolata**
64. Glumes with no reddish-brown flecks . . . . . **F. insignis**

65 Plant with long stolons . . . . . **F. vagans**
65. Plant without stolons **66**

66 Plants with broad leaves up to 4.5 mm wide; rays on the inflorescence scabrous . . . . . **F. clavata**
66. Plant with narrow leaves up to 3 mm wide; rays glabrous . . . . . **F. rara**

67 Glume surface pubescent and/or margins with long hairs **68**
67. Glume surface and margins glabrous **71**

68 Glumes with a distinct, broad, whitish membranous margin **69**
68. Glumes with no membranous margin . . . . . **F. corynocarya**

69 Glumes distichously arranged, similar to *Cyperus* . . . . . **F. fimbristyloides**
69. Glumes distinctly spirally arranged **70**

70 Base of the involucral bracts pubescent; top of stems scabrous . . . . . **F. phaeoleuca**
70. Base of the involucral bracts glabrous; stems glabrous . . . . . **F. cymosa**

71 Plant with long stolons . . . . . **F. vagans**
71. Plant without stolons **72**

72 Leaves reduced to loose sheaths; inflorescence consisting of 1 sessile spikelet plus 1–3 spikelets on branches to 2 cm long . . . . . **Abildgaardia vaginata**
72. Plants with long leaves, inflorescence not as above **73**

73 Stems sharply 4 or 5-angled **74**
73. Stems 3 angled, terete or compressed, may be ribbed **77**

74 Glumes 3–5 mm long . . . . . **F. eragrostis**
74. Glumes 1–1.5 mm long **75**

75 Glume mucro with a few scabrous hairs . . . . . **F. elegans**
75. Glume mucro absent or glabrous **76**

76 Spikelets ovoid to narrowly ovoid; leaves with a prominent mid-rib and rib like margins; rachillas with ragged scale like wings after the nuts have fallen . . . . . **F. quinquangularis**
76. Spikelets mostly globose; leaves with thinly grooved margins, no mid-nerve; rachillas not winged . . . . . **F. littoralis**

77 Glume with an obvious broad, whitish membranous margin **78**
77. Glume margin with no obvious membranous margin **81**

78 Glume apex obtuse or muticous . . . . . **F. cymosa**
78. Glume apex with a mucro or at least acute **79**

79 Glumes < 2 mm long . . . . . **F. elegans**
79. Glumes > 2 mm long **80**

80 Glume mucro *c.* 0.4 mm long; spikelets distinctly angular in cross section; . . . . . **F. subaristata**
80. Glume mucro *c.* 0.2 mm long or less; spikelets obscurely angular in cross section; . . . . . **F. micans**

81 Stems in upper part strongly flattened and winged . . . . . **F. complanata**
81. Stems not flattened, may be slightly compressed, but not winged **82**

82 Glumes with distinctly raised reddish brown flecks . . . . . **F. cinnamometorum**
82. Glumes with no reddish brown flecks **83**

83 Glumes > 2.5 mm long . . . . . **F. buchananensis**
83. Glumes < 2.5 mm long **84**

84 Spikelets not more than 1.2 mm wide . . . . . **F. microcarya**
84. Spikelets > 1.3 mm wide . . . . . **F. cymosa**

85 Stem in upper part strongly flattened and winged; ligule ciliate . . . . . **F. complanata**
85. Stems 3 sided; ligule membranous or absent **86**

86 Style with a basal whorl of hairs covering the apex of a dark achene . . . . . **F. furva**
86. Style not as above **87**

87 Achene with 5–10 conspicuous longitudinal ribs on either face with numerous cross-bars, glistening white to stramineous, rarely brown . . . . **F. dichotoma**[1]
87. Achene smooth, with 3 longitudinal ribs, finely reticulate, verrucose or tuberculate **88**

88 Glumes > 4 mm long . . . . . **F. neilsonii**
88. Glumes < 4 mm long **89**

89 Involucral bracts and surface of upper glumes pubescent . . . . . **F. sericea**
89. Involucral bracts and upper glumes not pubescent, margins of the glumes may be slightly ciliate **90**

90 Inflorescence a compact head of spikelets . . . . . **F. schultzii**
90. Inflorescence a panicle **91**

91 Glumes 1.3–2.5 mm long . . . . . **F. cymosa**
91. Glumes 2.8–3.4 mm long . . . . . **F. buchananensis**

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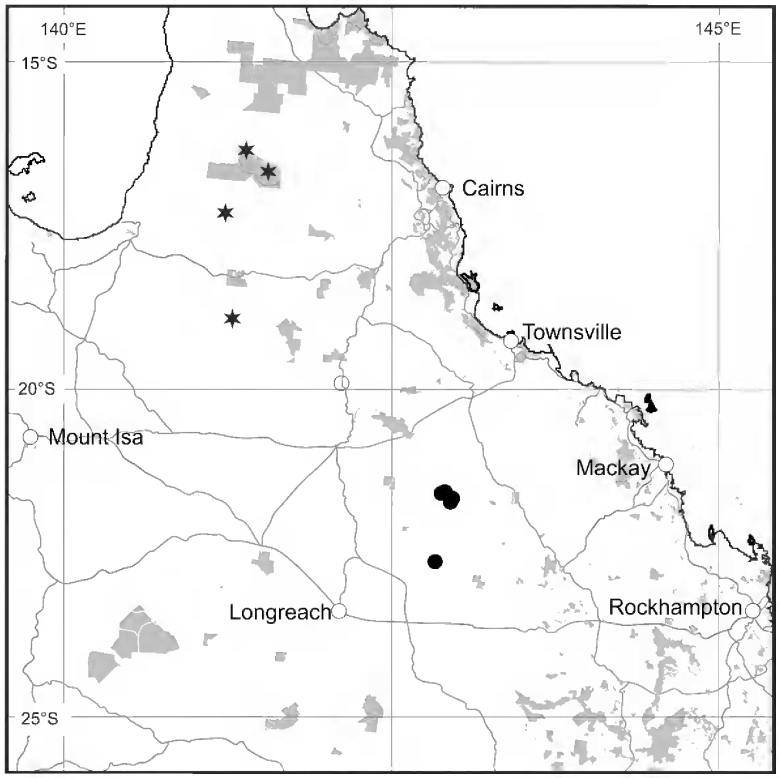

Map 1. Distribution of *Fimbristylis triloba* ✱ and *F. buchananensis* ●. Grey shaded areas are conservation reserves and National Parks.